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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,952	01/20/2006	Kazuya Tanaka	050246	4301

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EXAMINER	
LACLAIR, DARCY D	
ART UNIT	PAPER NUMBER
1796	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/531,952	TANAKA ET AL.	
	Examiner	Art Unit	
	Darcy D. LaClair	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) *1 and 9-14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/17/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. All outstanding rejections, except for those maintained below are withdrawn in light of the amendment filed on **11/5/2008**.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Upon reconsideration of the claims and an updated search, new grounds of rejection are set forth below which were are not necessitated by applicant's amendment. Thus, *a 2nd non-final Office action is set forth as follows.*

Double Patenting

2. **Claims 2, 3, and 6-7** are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over **claims 1-3** of copending Application No. 10/551,872 (US 2006/0194899).

The rejection is adequately set forth in **paragraphs 24-27** of the office action mailed **6/9/2008**, and is incorporated here by reference.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

3. **Claims 2 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Bastioli et al**. (**WO 02/059199**) in view of **Kanamori et al**. (**US 6,262,184**) with ***evidence*** provided by the **Showa Product Data page for Bionolle** (**2007**).

The examiner notes that the injection molded article of **Claim 7** is set forth in ***product-by-process*** format.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

Absent a showing of criticality, the process limitations in a ***product-by-process*** claim do not carry patentable weight. Nevertheless, as injection molding of articles is taught by **Bastioli**, the rejection is set forth below.

With regard to Claim 2, Bastioli teaches a mixture of biodegradable polyesters which includes (A) an aromatic-aliphatic polyester, (B) an aliphatic polyester, and (C) a polylactic acid polymer. (See abstract) For the aromatic aliphatic polyester, Bastioli exemplifies Ecoflex, manufactured by BASF, (see p. 13 Example 1) which is consistent with applicant's examples for aromatic aliphatic polyester that has a glass transition temperature of 0°C or less and a heat of crystal melting (ΔHm) of 30 J/g or less (see applicant's specification p. 16 par 1). For the aliphatic polyester, Bastioli exemplifies a polybutylenesebacate, but also demonstrates Bionolle 1903, from Showa Denko (See p. 14 Example 11), which is of the Bionolle series exemplified by applicant's for aromatic aliphatic polyester that has a glass transition temperature of 0°C or less and a heat of crystal melting (ΔHm) of 50 J/g -70 J/g (see applicant's specification p. 18 par 2, p. 19 par 3- p. 20 par 1) Applicant specifically teaches Bionolle 1001 and 1003, which have a ΔHm of 58.0 J/g. (See applicant's specification Tables 1-3, 5, 7-9) The Bionolle product data page teaches that Bionolle 1093 has the same glass transition temperature, but is

a long chain branched molecule and therefore has a higher melt strength and crystallizing temperature than the other linear-type grades. This means that it would be expected to have an equal or greater heat of crystal melting. (See Showa Bionolle) The combination of three resins taught by Bastioli is consistent with the three resins taught by applicant.

Bastioli teaches these resins in a differing concentration than that required by applicant. Specifically, Bastioli teaches the concentration of A varies between 40% and 70% by weight of A + B, and the concentration of C is between 6 and 30% by weight of the total resin content. The lactic acid resin content taught by Bastioli is below the 70% to 90% mass required by applicant. With regard to the polyesters other than the lactic acid resin, the relative content of these resins with respect to each other falls within the range for relative content taught by applicant. Specifically, applicant's (B), or Bastioli's (A), is present from 5% to 25% mass, relative to applicant's (C), or Bastioli's (B), at 10% to 30% mass. This is a range from 16.7% to 250% of applicant's (B), or Bastioli's (A). Bastioli specifically teaches against increasing the concentrations of the aliphatic-aromatic polyester (A), or the aliphatic polyester (B). (See p. 9 pars 2,3) Bastioli does not, however, teach against increasing the concentration of the lactic acid resin above that specifically taught. Rather, Bastioli teaches only that concentrations below 5% of the polylactic acid resin will have no effect on the balance of tearing properties or adjustment of the modulus. (See p. 9 par 4)

Kanamori teaches a biodegradable resin composition comprising polylactic acid and aliphatic polyester carbonate in a ratio of 95/5 to 5/95, or comprising mainly

polylactic acid and aliphatic polyester and/or aliphatic polyester carbonate. (See abstract) Kanamori teaches that a high ratio of polylactic acid will give a high tensile strength and flexural strength. Decreasing the aliphatic polyester component can also affect the degree of biodegradability and the transparency. (See col 6 line 37-49) Table 1 demonstrates that the degree of biodegradability is reduced as the ratio of polylactic acid resin is increased, and the tensile strength and flexural strength are also increased as the ratio of lactic acid resin is increased toward 90 (or 90%). (See col 10 line 42-65) This clearly shows that the content of polylactic acid based resin is a results effective variable. See MPEP § 2144.05 (B). Case law holds that "discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art." See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Bastioli teaches a wide variety of uses for the resin of the invention, including "food packaging bags, bin liners, and other packaging films which do, however, require considerable strength." (see p. 2 par 1) The examiner notes that bin liners with insufficient strength can be quite problematic on trash day. It would be obvious to one of ordinary skill in the art, particularly specifically in the area of biodegradable resin compositions, given the teaching of Kanamori, to adjust the ratio of poly lactic acid resin in the composition of Bastioli in order to obtain a resin which has an increased flexural strength and tensile strength for applications in which that is desirable. Based on the teachings of Kanamori, one of ordinary skill in the art would arrive at a composition having a high level of lactic acid based resin, as high as 90%, consistent with applicant's claimed range.

With regard to Claim 7, Bastioli teaches an injection molding step. (See p. 5 par 2) Bastioli teaches that the material can be used in the injection molding field in order to produce cutlery, food containers, containers for agriculture or industry, pharmaceutical containers, and so on. (See p. 13 par 1)

4. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Bastioli et al**. (**WO 02/059199**) in view of **Kanamori et al**. (**US 6,262,184**) with ***evidence*** provided by the **Showa Product Data page for Bionolle** (**2007**), further in view of **Wypych** (**2000**) (pages as indicated below).

The discussion of **Bastioli, Kanamori** and **Showa-Bionelle**, above in **paragraph 3** is incorporated here by reference.

With regard to Claim 3, Bastioli teaches that inorganic fillers may be employed, (p. 9 par 6) such as silica, calcium carbonate, talc, kaolin, kaolinite, zinc oxide, and various wollastonites, as well as inorganic lamellar substances, added from between 0.05 and 70%, preferably between 1 and 30%. This encompasses applicant's claimed compositional range. Typical particle sizes commercially available are shown below, with clay included as a generic class for kaolin and wollastonites. It would be obvious to one of ordinary skill in the art to select commercially available fillers in a typical size. As demonstrated by the table below, the fillers listed by Bastioli are consistent with the size range claimed by applicant.

Filler	Pages of Wypych	Size (μm)
Talc	150-153	1.4 - 19

Calcium carbonate	48-57	0.3-30 0.2 -0.4 (precipitated)
Silica	131-146	5-40 (fumed) 4-28 (fused) 1-40 (precipitated) 2-19 (quartz) 2-90 (sand) 2-15 (silica gel)
Clay	75-76	0.4 - 5

5. **Claims 4-5** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Bastioli et al**. (**WO 02/059199**) in view of **Kanamori et al**. (**US 6,262,184**) with ***evidence*** provided by the **Showa Product Data page for Bionolle** (**2007**), further in view of **Downie et al**. (**US 2001/0027225**)

The discussion of **Bastioli, Kanamori** and **Showa-Bionelle**, above in **paragraph 3** is incorporated here by reference.

With regard to Claim 4, Bastioli teaches that a wide variety of additives and applications are appropriate for the resin of the invention. (See p. 9 par 6 – p. 13 par 2) Many of these applications require a high degree of biodegradability upon disposal. Bastioli does not teach a carbodiimide compound. Downie teaches a process for manufacturing polymers containing a degradant component that increases the rate of polymer degradation. (see Abstract) Applicable polymers include polyesters (see par [0076]) The degradant component is typically added in an amount from about 0.01 to 10 percent (see par [0097]) and can be carbodiimides (see par [0094]). It would be

obvious to one of ordinary skill in the art to incorporate such a degradant compound in order to better achieve the aim of the invention, which is to provide a biodegrading resin composition.

With regard to Claim 5, Downie teaches that an inhibitor component is also added to the resin from about 0.01 to 10 percent by weight to stabilize the composition during processing. (See par [0099]) The inhibitor component can be an antioxidant and a preferred species is 3,5-bis(1,1-dimethyl ethyl)-4-hydroxy-octadecyl ester. (See par [0102]) It would be obvious to add this inhibitor component in order that the polymer is not degraded during production of the material.

6. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Bastioli et al**. (**WO 02/059199**) in view of **Kanamori et al**. (**US 6,262,184**) with ***evidence*** provided by the **Showa Product Data page for Bionolle** (**2007**), further in view of **Akao et al.** (**US 5,814,497**)

The discussion of **Bastioli, Kanamori** and **Showa-Bionelle**, above in **paragraph 3** is incorporated here by reference.

With regard to Claim 6, Bastioli and Kanamori teach additives such as colorings and pigments (see Bastioli p. 9 par 6, Kanamori col 8 line 56-63) While pigments and colorings are generic to a hiding agent, neither Bastioli or Kanamori specifically discloses the type or content of these colorings or pigments. Akao teaches colored compositions for use in polymeric packaging materials (see col 1 line 1-15) which can be used in a variety of resins (see col 5, 6) which can include biodegradable polymers

such as polycaprolactone and Biopol (col 11 line 38-59) Akao teaches inorganic pigments which can be used, and those which are preferable have a high refractive index. Representative examples include titanium oxide, having a refractive index over 2.5, silicon carbide (2.67), zinc oxide (2.37), antimony oxide (2.35), and others (see col 17 line 5-20) as well as carbon black as a black pigment (see col 15 line 34-35). One packaging material will have 0.2 to 50 parts by weight of carbon black per 100 parts of resin (see col 3 line 43-50), and one master batch contains 5 to 60 weight percent of the light shielding material (pigment) (see col 2 line 60), which is used in 100 parts with 300 parts of a thermoplastic resin. (See col 3 line 53-55) This would be about 1 to 15 parts by weight of inorganic pigment. It would be obvious to one of ordinary skill in the art to use an inorganic pigment such as those taught by Akao to pigment the composition of Bastioli in view of Kanamori. With regard to the content of pigment, Akao teaches a range which encompasses applicant's range.

7. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Bastioli et al**. (**WO 02/059199**) in view of **Kanamori et al**. (**US 6,262,184**) with ***evidence*** provided by the **Showa Product Data page for Bionolle** (**2007**), further in view of **Obuchi et al.** (**US 6,916,950**)

The discussion of **Bastioli, Kanamori** and **Showa-Bionelle**, above in **paragraph 3** is incorporated here by reference.

The examiner notes that the injection molded article of **Claim 8** is set forth in ***product-by-process*** format. Absent a showing of criticality, the process limitations in a

product-by-process do not carry patentable weight. Never-the-less, as the process is taught by **Obuchi**, the rejection is set forth below.

With regard to Claim 8, Bastioli teaches injection molded items such as food containers (See p. 13 par 1) of the polylactic acid and polyester resin composition with a filler such as silica. Kanamori teaches the benefits of the polylactic acid resin, motivating an adjustment of content of this component. (See discussion, above, of **Claim 2**) Neither Bastioli or Kanamori teach further crystallizing the injection molded object. Obuchi teaches a thermal resistant resin comprising a polyester having 25% to 75% of a lactic acid based polymer and 25% to 75% of other aliphatic polyester, and 0.1 to 70 parts of a crystalline inorganic filler. (See abstract) Obuchi teaches that containers and packaging materials obtained by common injection molding have a disadvantage in thermal resistance, so containers for hot water or use in a microwave oven can be inadequate. (See col 1 line 45-50) By crystallizing, the resin is given thermal resistance, and therefore improved. The inventors have disclosed a technique for mixing polylactic acid with crystalline SiO_2 (silica) and holding the mold at a temperature of 85-125^{o}C in order to crystallize the resin in the mold. (See col 3 line 13-22) It would be obvious to one of ordinary skill in the art to take this additional step in order to give thermal resistance to products such as Bastioli's food containers, which can be used in applications requiring temperature resistance.

Response to Arguments

8. Applicant's arguments filed **11/5/2008** have been fully considered. Specifically, applicant argues **(A)** The abstract and specification have been amended to make the title more descriptive, clarify the abstract, correct informalities in the disclosure, and to correct errors; the correction to the errors in the specification is supported by page 8 line 7 to page 10 line 1 of the original specification and the amendment to Table 8 is supported by page 56 line 19, page 57 lines 2-8, 12-16, and 21-25, and page 53, lines 4-8, **(B)** Claims 2-6 have been amended to improve the clarity of the claims, overcoming the objection to Claim 2 and the rejections under 35 U.S.C. 112 first and second paragraphs, because the claims now clearly recite the components of the resin composition and the content of each, **(C)** Ebato and the combination of Ebato with supporting documents and Wypych fails to anticipate or render obvious the rejected claims because Ebato's lactide is reacted with a polyester polymer comprising an aliphatic dicarboxylic acid unit and/or aromatic dicarboxylic acid, thereby resulting in a copolymer formed from the polyester and the lactide, rather than a composition comprising different blended resins, as claimed in the instant application; specifically, Ebato discloses starting materials for making a copolyester, rather than components of a resin blend.

With respect to arguments (A), applicant's arguments have been considered. The objections to the title, abstract, and disclosure are withdrawn in light of applicant's amendments. Support for the correction of errors in the specification is noted as indicated by applicant.

With respect to argument (B), applicant's arguments have been considered and the objections and rejections are withdrawn *in light of applicant's amendments* significantly improving the clarity of the claims at issue.

With respect to argument (C), applicant's arguments have been considered, but are moot in view of the rejection set forth above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Darcy D. LaClair whose telephone number is (571)270-5462. The examiner can normally be reached on Monday-Friday 8:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/DDL/

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